

What is claimed is:

1. A fabric comprising connecting material and an array of plates affixed to the connecting material, which plates are affixed in a spaced relationship to each other.
2. A fabric comprising connecting material and a plate affixed to connecting material.
3. A fabric comprising connecting material and a plurality of plates affixed to the connecting material, which plates are affixed in a spaced relationship to each other.
4. A fabric comprising connecting material and a plurality of plates affixed to the connecting material, wherein the plates are maintained in a spaced relationship to one another by the connecting material.
5. A fabric comprising a plurality of plates affixed to a means for flexibly connecting the plates together in a spaced relationship.
6. The fabric of any of claims 1 through 5 further comprising more than one layer of fabric in a stack.

7. The fabric of claim 6, wherein the layers in the stack are affixed each other.
8. The fabric of claim 7, wherein the layers in the stack are affixed by bonding them together at locations on the continuous portions of the layers.
9. The fabric of claim 7, wherein the layers in the stack are affixed by bonding them together at locations on the discontinuous portions of the layers.
10. The fabric of claim 7, comprising more than two layers of fabric wherein the affixing locations between each set of adjacent layers is staggered from the affixing locations between each successive set of adjacent layers in the fabric stack so that the affixing locations between successive adjacent layers are not superimposed.
11. The fabric of claim 7, wherein the layers are affixed together at locations on continuous and discontinuous portions of the layers.
12. The fabric of claim 1, wherein the connecting material is selected from material that is woven, non-woven, porous, flexible and that has a limit to its stretchability.

13. The fabric of claim 1, wherein the plates have an abrasive surface.
14. A fabric comprising base material and an array of plates affixed to at least one side of the base material, which plates are affixed in a spaced relationship to each other.
15. A fabric comprising base material and a plurality of plates affixed to a least one side of the base material.
16. A fabric comprising base material and a plurality of plates affixed to at least one side of the base material, wherein the array of plates are maintained in a spaced relationship to one another by the base material.
17. The fabric of any of claims 14 through 16, further comprising more than one layer of those fabrics in a stack.
18. The fabric of claim 17, wherein the layers in the stack are affixed to each other.
19. The fabric of claim 18, wherein the layers in the stack are affixed to each other by bonding at locations on the base material portions of the layers.

20. The fabric of claim 17, comprising more than two layers of fabric wherein the affixing locations between a first set of adjacent layers is staggered from the affixing locations between successive adjacent layers in the fabric stack so that the affixing locations between successive adjacent layers are not superimposed.
21. The fabric of claim 18, wherein the layers in the stack are affixed together by bonding at a location on at least one of the plates affixed to at least one side of the base material.
22. A fabric of any of claims 14 through 16, comprising plates made of a polymeric substance.
23. A fabric of claim 1, wherein the plates are affixed to the connecting material by bonding.
24. A fabric of claim 1, wherein the plates are affixed to the connecting material by forming an uncured polymeric substance in the form of a plate on the connecting material and then curing the polymeric substance to form the plate, which extends through the connecting material web so that at the location of the plate the connecting material becomes an integral part of the plate.

25. A fabric comprising connecting material, an array of plates affixed to the connecting material, and a mesh reinforcement of the plates, which plates are maintained in a spaced relationship to one another by the connecting material.
26. A fabric comprising base material, an array of plates affixed to the base material, and a mesh reinforcement of the plates, which plates are maintained in a spaced relationship to one another by the base material.
27. The fabric of claim 25 or 26, further comprising more than one layer of the fabric in a stack..
28. A method of making the fabric of claim 25, comprising the steps of:
 - a. covering connecting material with mesh reinforcement;
 - b. coating the connecting material-mesh reinforcement combination with polymeric resin;
 - c. placing a photo mask patterned with openings in the form of an array of plates over the connecting material-mesh reinforcement-polymeric resin combination;

- d. exposing the photo masked combination of step (c) to a curing agent to cure the polymeric resin not covered by the photo mask;
- e. washing away the unexposed, uncured polymeric resin to form the gaps in the fabric; and
- f. etching away the exposed mesh reinforcement in the gaps, wherein the fabric has an array of reinforced plates held in a spaced array by connecting material.

29. A method of making the fabric of claims 26, comprising the steps of:

- a. covering base material with mesh reinforcement;
- b. coating the base material-mesh reinforcement combination with polymeric resin;
- c. placing a photo mask patterned with openings in the form of an array of plates over the base material-mesh reinforcement-polymeric resin combination;
- d. exposing the photo masked combination of step (c) to ultra violet light to cure the polymeric resin not covered by the photo mask; and

- e. washing away the unexposed, uncured polymeric resin to form the gaps in the fabric, wherein the fabric has an array of reinforced plates held in a spaced array by base material and mesh reinforcement.
- 30. The fabric of claim 27, wherein the mesh reinforcement is metal.
- 31. A fabric comprising base material affixed to a connecting material, which connecting material has an array of mesh reinforced plates affixed to the connecting material so that the plates are maintained in a spaced relationship to one another.
- 32. The fabric of claims 25, 26 or 31, comprising plates made of a polymeric substance.
- 33. A fabric comprising connecting material and an array of metal plates affixed to the connecting material, which plates are maintained in a spaced relationship to one another by the connecting material.
- 34. A method of making the fabric of claim 33 comprising the steps of:
 - a. coating connecting material with a bonding agent;
 - b. covering the bonding agent coated connecting material with a metal sheet;

- c. coating the combination of step (b) with a photo resist film patterned with openings in the photo resist film in the form of gaps between an array of plates;
- d. exposing the photo resist film combination of step (c) to a metal etching material to etch away the metal sheet not covered by the photo resist film; and
- e. removing the photo resist film, wherein the fabric has an array of metal plates held in a spaced array by connecting material.

35. A method of making the fabric of claim 33, comprising the steps of:

- a. applying bonding material to connecting material at those areas where plates will be located on the connecting material;
- b. covering the bonding agent coated connecting material with a metal sheet;
- c. coating the combination of step (b) with a photo resist film patterned with openings in the photo resist film in the form of gaps between an array of plates;

- d. exposing the photo resist film combination of step (c) to a metal etching material to etch away the metal sheet not covered by the photo resist film; and
 - e. removing the photo resist film, wherein the fabric has an array of metal plates held in a spaced array by connecting material.
36. The fabric of claims 1, 14, 27 or 33, wherein the thickness of the plate is not greater than size of the gap between the plates.
37. The fabric of claim 36, wherein the plate material thickness is in the range of 2-5 mils.
38. A fabric comprising:
- a. a base material;
 - b. a first connecting material bonded on a first surface of the base material and a second connecting material bonded on a second surface of the base material, each of the first and second connecting material having an array of metal plates affixed to the first and second connecting material so that the first and

second connecting material maintain the plates in pre-spaced relationship to one another; and

c. each of the first and second connecting material having its array of metal plates oriented to each other to minimize registration of inter-plate apertures between the plates.

39. A fabric comprising:

a. a first connecting material and an array of metal plates affixed to the first connecting material, which plates are maintained in a spaced relationship to one another by the first connecting material;

b. a second connecting material and an array of metal plates affixed to the second connecting material, which plates are maintained in a spaced relationship to one another by the second connecting material; and

c. the second connecting material affixed to the first connecting material in an orientation to each other to minimize registration of inter-plate apertures between the plates.

40. A fabric comprising a first array of metal plates bonded to a second array of metal plates so that each layer of metal plates is held in a spaced array by the other layer of metal plates, the first array of metal plates oriented to the second array of metal plates to minimize registration of inter-plate apertures between the plates
41. A method of making a fabric, comprising the steps of:
- a. applying bonding material to a first metal sheet;
 - b. covering the bonding material with a second metal sheet;
 - c. coating the first metal sheet of the combination of step (b) with a first photo resist film patterned with openings in the first photo resist film in the form of gaps between an array of plates;
 - d. coating the second metal sheet of the combination of step (b) with a second photo resist film patterned with openings in the second photo resist film in the form of gaps between an array of plates, the second photo resist film oriented to the first photo resist film to minimize registration of inter-plate apertures between the plates;

- e. exposing the first and second photo resist film combination of step (d) to a metal etching material to etch away the metal sheet not covered by the photo resist film; and
- f. removing the photo resist film, wherein the fabric has a first and second layer of metal plates, each layer of metal plates held in a spaced array by the other layer of metal plates.

42. A method of making a fabric, comprising the steps of:

- a. applying bonding spots to a first metal sheet;
- b. covering the first metal sheet of step (a) to a second metal sheet;
- c. coating the first metal sheet of step (b) with a first photo resist film patterned with openings in the first photo resist film in the form of gaps between an array of plates;
- d. coating the second metal sheet of step (b) with a second photo resist film patterned with openings in the second photo resist film in the form of gaps between an array of plates, the second photo resist film oriented to the first photo resist film to

minimize registration of inter-plate apertures between the plates;

e. exposing the first and second photo resist film of step (d) to a metal etching material to etch away the metal sheet not covered by the photo resist film; and

f. removing the photo resist film, wherein the fabric has a first and second layer of metal plates, each layer of metal plates held in a spaced array by the other layer of metal plates and the bonding spots of step (a) located so that the bonding spots connect the metal plates in the first layer of metal plates to the adjacent metal plates in the second layer of metal plates.

43. A fabric comprising connecting material, an array of metal plates affixed to the connecting material, and a mesh reinforcement of the metal plates, which plates are maintained in a spaced relationship to one another by the connecting material.

44. A fabric comprising:

a. a base material; and

- b. a connecting material bonded on a surface of the base material, the connecting material having an array of metal plates affixed to the connecting material so that the connecting material maintains the plates in pre-spaced relationship to one another.
- 45. A fabric comprising a base material having an array of metal plates affixed to the base material so that the plates are maintained in pre-spaced relationship to one another.
- 46. A fabric of claim 7, wherein the layers are affixed by bonding using an array of shapes in the form of disconnected lines with neighboring disconnected lines perpendicular to each other.
- 47. A fabric comprising (a) a base material; (b) a connecting material supported on a first surface of the base material; and (c) a layer of plates established through the connecting material and affixed to the base material, so that the connecting material maintains the plates in a pre-spaced relationship to each other.
- 48. A fabric according to claim 41, wherein a first connecting material is supported on the first surface of the base material and a second

connecting material is supported on a second surface of the base material;

- a. a plate array is established through the first connecting material and affixed to the first surface of the base material and a plate array is established through the second connecting material and affixed to the second surface of the base material;
- b. so that the plates in each of the plate arrays are maintained in a pre-spaced relationship to each other; and
- c. the first and second layers of plate arrays are oriented to each other to minimize registration of inter-plate apertures between the plate arrays in the first and second layers.

- 49. A fabric according to claim 48, wherein the plate arrays on both the first and second surfaces of the base material are selected from identical and different.
- 50. A fabric according to claim 48, wherein an array of aperture plates are affixed to the base material between the base material and at least one of the first or second layers of plate arrays in a pre-spaced relationship

to each other and sized and spaced to overlap the inter-plate apertures of the first and second layers of plate arrays.

51. A fabric according to claim 48, wherein the plates in the first and second plate arrays are guard plates and at least one of the guard plate array layers has aperture plates affixed to the at least one guard plate array layer surface facing away from the base material, which aperture plates are maintained in a pre-spaced relationship to each other and sized and spaced to overlap the inter-plate apertures of the first and second layers of the guard plate array layers.
52. A fabric according to claim 47, wherein:
 - a. a first surface of a first base material is opposite a second surface of the first base material, which second surface of the first base material is covered by a first layer of plates;
 - b. a first surface of a second base material is opposite a second surface of the second base material, which second surface of the second base material is covered by a second layer of plates;

c. the first surfaces of the first and second base material each affixed to an array of aperture plates sized and spaced to overlap the inter-plate apertures of the first and second layers of plates, so that the first and second base materials are covered by plates, selected from guard plates, aperture plates and combinations thereof; and

d. the first and second base materials oriented to each other to minimize registration of the inter-plate apertures between the first and second layers of plates.

53. A fabric according to claim 47, wherein the connecting material between the plates relieves debonding stresses on individual plates by dissipating debonding stresses throughout the plate array.
54. A fabric according to any of claims 47 through 53, wherein the plates are selected from penetration resistant and a heat curable epoxy.
55. A fabric according to any of claims 47 through 57, wherein the plates in each layer are oriented to each other so that apertures do not form a straight line across the fabric.

56. A fabric according to any of claims 47 through 53, wherein the connecting material is a polyester chiffon.
57. A fabric according to any of claims 47 through 53, wherein the base material is a non-woven polyurethane and nylon synthetic leather.
58. A fabric according to any of the claims 47 through 53, wherein layers, plates, or base material are affixed by bonding.
59. A fabric comprising:
- a. three layers, wherein each layer is a plate array established through a connecting material, so that the connecting material maintains the plates of the array in a pre-spaced relationship to each other;
 - b. the layers oriented to each other to minimize registration of the inter-plate apertures between the three layers of plate arrays; and
 - c. the connecting materials of adjacent layers are affixed to each other.
60. A fabric according to claim 59, wherein the adjacent layers are affixed by bonding each layer to the other at bonding spots patterned between

the plates and no spots of one layer are superimposed upon spots of another layer.

61. A fabric comprising:

- a. a base material; and
- b. a layer supported on a first surface of the base material, the layer having a pattern of continuous and discontinuous portions with the discontinuous portions bonded through the continuous portions and into the first surface of the base material, so that the continuous portion maintains the discontinuous portions in a pre-spaced relationship to each other.

62. A fabric according to claim 61, further comprising a layer of continuous and discontinuous portions supported on a second surface of the base material with the layers oriented to each other to minimize registration of the discontinuous portions in each of the layers.

63. A fabric according to claim 62, wherein the continuous and discontinuous portions on both base material surfaces are selected from identical and different.

64. A fabric according to claim 62, wherein a layer of discontinuous portions is impressed into the base material in a pre-spaced relationship, sized, and spaced to overlap the continuous portions of the layer of continuous and discontinuous portions, so that the base material is covered by discontinuous portions of the overlapped layers.
65. A fabric according to claim 62, wherein
- a. a first layer of continuous and discontinuous portions is overlaid with a second layer of continuous and discontinuous portions, so that the first and second layers are registered to each other to minimize areas of continuous portions and so that the base material is covered by registered discontinuous portions of the layers;
 - b. and wherein the continuous portion of the second layer is bonded to the discontinuous portion of the first layer.
66. A fabric according to claim 61, wherein:

- a. a first and a second base material oriented with a second surface of the first base material opposite the second surface of the second base material;
 - b. the first and second base materials oriented to each other to minimize registration of the continuous portions which lie between the discontinuous portions in the layers on the first surfaces of the first and second base material; and
 - c. the second surface of the first base material opposite the second surface of the second base material bonded to each other by an array of discontinuous portions sized and spaced to overlap the continuous portions of the layers on the first surfaces of the first and second base materials.
67. A fabric according to any of claims 61 through 66, wherein the continuous portion between the discontinuous portions relieves debonding stresses on individual discontinuous portions by dissipating debonding stresses throughout the layer.
68. A fabric according to any one of claims 61 through 66, wherein the discontinuous portions are selected from penetration resistant and a heat curable epoxy.

69. A fabric according to any of claims 61 through 66, wherein the discontinuous portions in each layer are oriented to each other so that continuous portions do not form a straight line across the fabric.
70. A fabric according to any of claims 61 through 66, wherein the continuous portions are a polyester chiffon.
71. A fabric according to any of claims 61 through 66, wherein the base material is a non-woven polyurethane and nylon synthetic leather.
72. A fabric comprising:
- a. three layers;
 - b. wherein each layer has a pattern of continuous and discontinuous portions, so that the continuous portion maintains the discontinuous portions in a pre-spaced relationship to each other, the layers oriented to each other to assure registration of the discontinuous portions of the three layers to each other so that the fabric is essentially completely covered by discontinuous portions; and
 - c. wherein the continuous portions of adjacent layers are bonded to each other.

73. A fabric according to claim 72, wherein the adjacent layers are bonded to each other at bonding spots patterned in the continuous portions and no spots of one layer superimpose spots of another layer.
74. A fabric according to claim 72, wherein the adjacent layers are bonded to each other at bonding spots non-commensurate with the discontinuous portions.
75. A fabric according to any one of claims 72 through 74, wherein the discontinuous portions are selected from penetration resistant and a heat curable epoxy.
76. A fabric according to any of claims 72 through 74, wherein the discontinuous portions in each array are oriented to each other so that continuous portions do not form a straight line across the fabric.
77. A fabric according to claim 72, wherein the layers are selected from identical and different.
78. A fabric according to any of claims 72 through 74, wherein the continuous portions are a polyester chiffon.
79. A fabric according to any of claims 72 through 74, wherein the base material is a non-woven polyurethane and nylon synthetic leather.

80. A method of printing polymer resin plates onto a base material comprising:
- a. layering a connecting material onto the base material;
 - b. positioning a template atop the connecting material;
 - c. printing polymer resin plates through the connecting material into the base material;
 - d. removing the template; and
 - e. curing the polymer resin.
81. A method according to claim 80, wherein the polymer resin is a heat curable epoxy.
82. A method according to claim 80, wherein the connecting material is a polyester chiffon.
83. A method according to claim 80, wherein the base material is a non-woven polyurethane and nylon synthetic leather.